

FIG. 1.

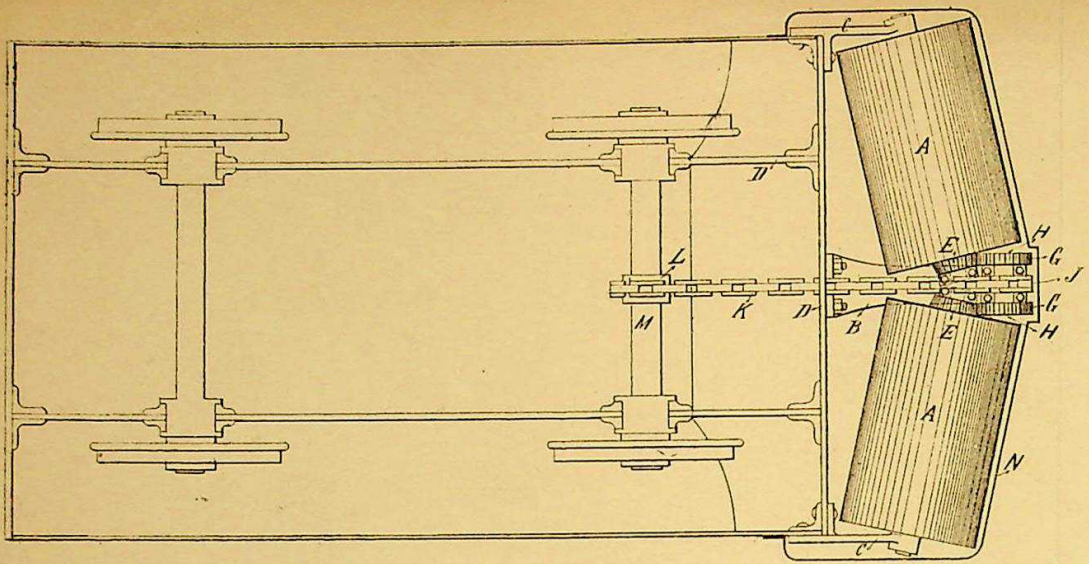
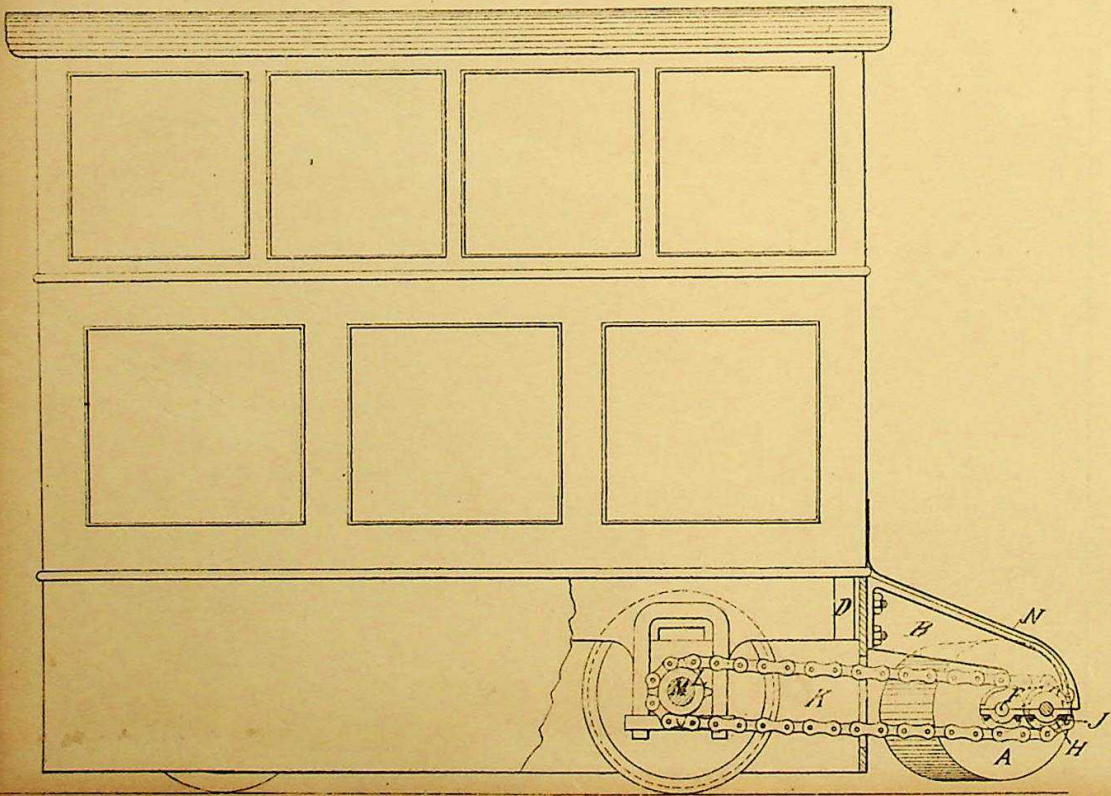


FIG. 2.

*Rawnsky*



*Wheel  
Penders*

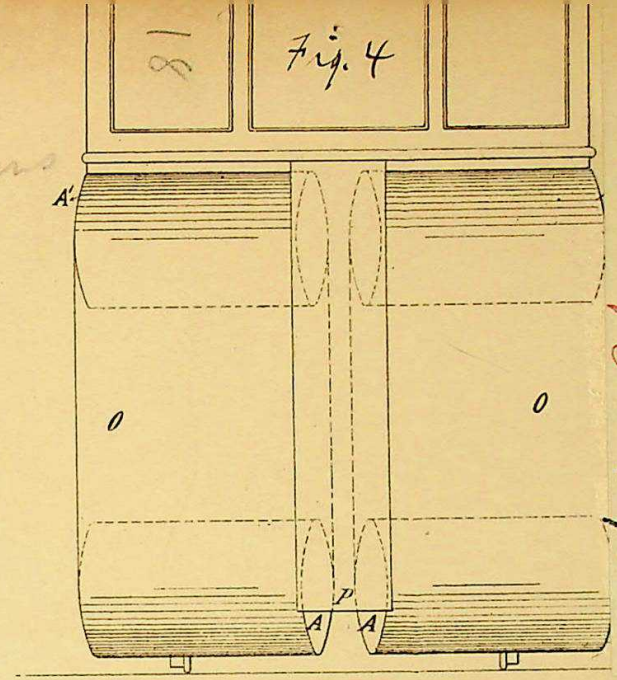
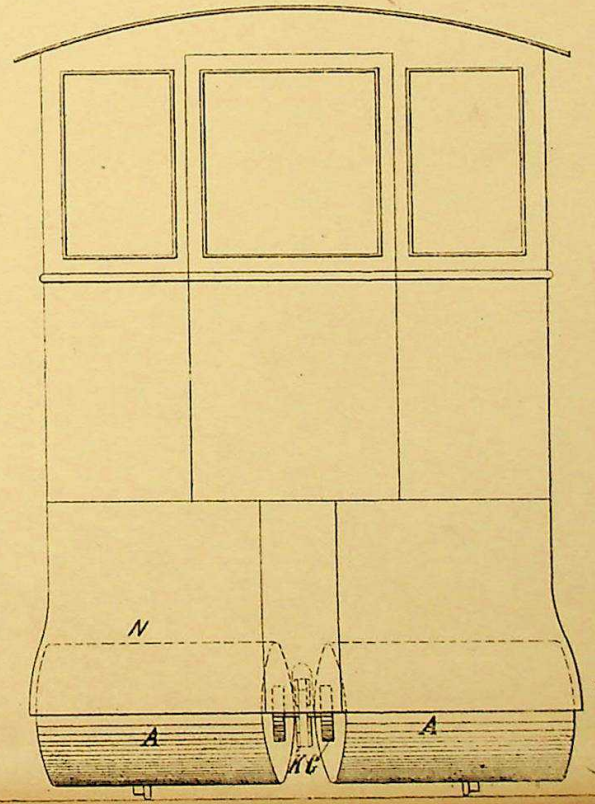


FIG. 3.



203. VEHICLE PENDERS.

18 5/1885

ENGLISH

6,332 of 1885

Am. 24



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A.D. 1885, 23rd MAY. N° 6332.

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PROVISIONAL SPECIFICATION.

**An Improved Guard for Tram Engines and Tram Cars.**

I JOHN RAWNSLEY of Cobden Street Lister Hills, Bradford in the County of York, Engineer do hereby declare the nature of my invention for AN IMPROVED GUARD FOR TRAM ENGINES AND TRAM CARS to be as follows:—

5 This invention relates to an improved guard for tram engines and cars by which means any comparatively light obstruction (for instance a foot passenger) in front of such tram engine or car is pushed or rolled on one side off the track.

To apply my invention to a tram engine or car I fit on the front of it, and close to the bottom, two guard rollers, by preference of a conical or taper form and covered with india-rubber or other elastic material, these guard rollers are made  
10 to revolve in a nearly horizontal position in a direction opposite to the tram engine or car's wheels, and at a greater surface speed than such wheels, and are driven by mechanism preferably connected with the front axle of the tram engine or car. The guard rollers are placed with their largest ends meeting in front of the tram engine, or car, and in advance of the outside ends, thus any obstruction  
15 coming in contact with the front of the engine or car is pushed, or rolled off the track.

I may employ more than two guard rollers and place them over the hereinbefore mentioned guard rollers, in which case they are driven by intermediate gearing or by a vertical shaft.

20 Dated this 22nd day of May 1884.

DRACUP & NOWELL,  
Agents for the Applicant.



*Rawnsley's Improved Guard for Tram Engines and Tram Cars.*

## COMPLETE SPECIFICATION.

**An Improved Guard for Tram Engines and Tram Cars.**

I JOHN RAWNSLEY, of Cobden Street Lister Hills, Bradford, in the County of York, Engineer do hereby declare the nature of my invention for AN IMPROVED GUARD FOR TRAM ENGINES AND TRAM CARS, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

5

This invention relates to an improved guard for tram engines and tram cars, by which any comparatively light obstruction (as for instance a foot passenger) in front of such tram engine or car is pushed or rolled on one side off the track.

To apply my invention to a tram engine, or car I fit on the front of it, close to the bottom, two horizontal guard rollers, covered with india rubber or other elastic material, with their inner ends meeting in front, and in advance of their outer ends, and when the tram engine, or car, is in motion such guard rollers are made to revolve (preferably by mechanism connected with the front axle of the engine or car) at a greater surface speed than and, in a contrary direction to the wheels of the engine, or car; thus any obstruction coming in contact with the front of such engine, or car, is pushed or rolled off the track by the guard rollers.

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Reference is to be had to the accompanying drawings forming part of this specification in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is an inverted plan of a tram engine fitted with my improved guard rollers and the mechanism for driving them. Figure 2 is a side elevation partly in section, and Figure 3 is a front elevation of the same. Figure 4 is a front elevation of a tram engine fitted with four guard rollers.

20

The two guard rollers A are supported in bearings formed in the central bracket B and the outer brackets C, fixed to the framework of the engine D, and such rollers are driven by means of the bevel wheels E keyed on their arbors F which wheels gear with the wheels G keyed on the chain wheel shaft H and the chain wheel J on the shaft H is actuated by the chain K from the chain wheel L on the front axle M of the engine. The cover N closes the space between the inner ends of the guard rollers and encloses the upper surface and outer ends of such rollers. The chain wheel J being smaller than the chain wheel L and the bevel wheels E being of less diameter than the wheels G the surface speed of the rollers A is considerably faster than the speed of the engine, and such rollers being back from the centre of the front of the engine they tend to push or roll any obstacle off the track.

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I may if the mechanism or construction of the engine or car necessitates it employ other methods of driving the guard rollers but I prefer the method described, as the rollers may thus be placed comparatively close together.

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Referring to Figure 4. The bottom guard rollers A are driven in the manner hereinbefore described, and the top rollers A<sup>1</sup> are supported by brackets on the front of the engine, and are driven by the wide belts O passing round the bottom and top rollers A and A<sup>1</sup>; thus forming a guard for the whole front of the engine. A cover P is placed over the opening between the two belts. The belts O are preferably made from india rubber belting, or other material not effected by the atmosphere.

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*Rawnsley's Improved Guard for Tram Engines and Tram Cars.*

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Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed I declare that what I claim is

5 (1.) The application to tram engines, or cars, of guard rollers (A) revolving at a greater surface speed than the speed of such engines or cars substantially as herein shewn and described and for the purpose set forth.

(2.) The application to tram engines or cars of two pairs of guard rollers (A and A<sup>1</sup>) connected by belts (O) as herein shewn and described and for the purpose specified.

10 Dated this 25th day of November 1885.

DRACUP & NOWELL,  
Bradford.  
Agents for the Applicant.

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For Her Majesty's Stationery Office.

1885.



Munro & Co.

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St. C.